

Flash Point Tests of BC-517L

The flash point of BC-517L was tested with a Automatic Pensky-Martens Closed Cup Flash Point Tester and a Setaflash™ 'Series 3' Closed Cup Tester . The BC-517L flash point did not conform to the MSDS. This maybe do to the >30 % Pseudocumene (1,2,4-Trimethylbenze) . This is not an uncommon occurrence in mixtures with differing boiling points and flash points.

Pseudocumene and White Mineral Oil were tested to confirm the data. I suspect that the pseudocumene with a flash point of 118F is surfacing as the mixture is stirred and heated. Oil is sometimes used as a flash suppressant in a flammable mixture to raise the flash point above 140 F to be classified as a combustible mixture instead of a flammable mixture. While it works, it gives a false sense of security. While this is not the case with the stable mixture of BL-517I, it is mentioned because under the right conditions mixtures sometime give strange flash points and the lower flash point components can to release as the mixture temperature elevates or nears the lower components flash point and boiling points.

	BC-517L	Pseudocumene	White Mineral Oil
	Tested (MSDS)		
Pensky Marten Closed Cup	187F (215F)	119F (118F)	178F (177F)
Setaflash	180 F (215 F)	118F (118F)	175F (177F)

Flammability Testing:

It was determined during the PVC extrusion test that a thin film of the BC-517L could be ignited at with a torch but was difficult to ignite with a low energy flame or a heat source and candle. The next series of test were to show the ignitability of the BC-517L in a pool or spill condition when exposed to an open flame and low energy flame. The test was conducted at room temp 75C and heating the pan to 150 F (near the measured flash point) and applying the ignition sources. A very hard to see panama occurred, the flame of the wick actually grew and burning occurred near the flame but never flashed even when the BC-517L was nearing its flash point temp. It also must

be remember this test was conducted in a large open test chamber and the LEL of the mixture (1%) could have been reached if off gassing of the pseudocume occurred in a void. I would suspect the Pseudocumene above 100 F is starting to separate from the mixture and would be subject to ignition from electrostatic charges or heat sources. The mineral oil portion of the mixture seems to surpress pseudocume from burning except for the area near the flame. In Test Four a torch was used for ignition. While there was ignition it did not flash across the surface and was limited to about one third of the pan.

Test series 1. Room temp 75F

Dish filled ½ inch with BC 517L.

1. Exposed to low energy flame for 10 seconds. No ignition
2. Exposed to low energy flame for 30 seconds. No ignition
3. Exposed to candle wick burning at surface of BC-517. No ignition but increased flame on wick.
4. Low energy flame 30 seconds added to the candle flame. No ignition.





Test 2: BC-517L temperature was raised to boil with a heat gun.

1. Exposed to low energy flame for 10 seconds. No ignition
2. Exposed to low energy flame for 30 seconds. No ignition
3. Exposed to candle wick burning at surface of BC-517. No ignition but increased flame on wick.
4. Low energy flame 30 seconds added to the candle flame. No ignition.

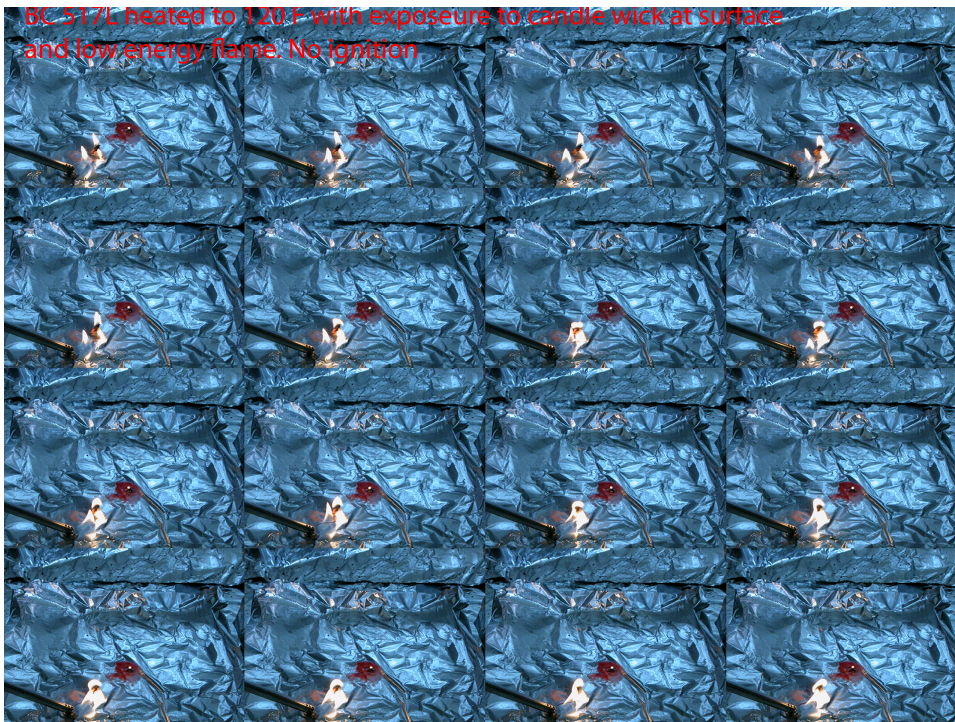


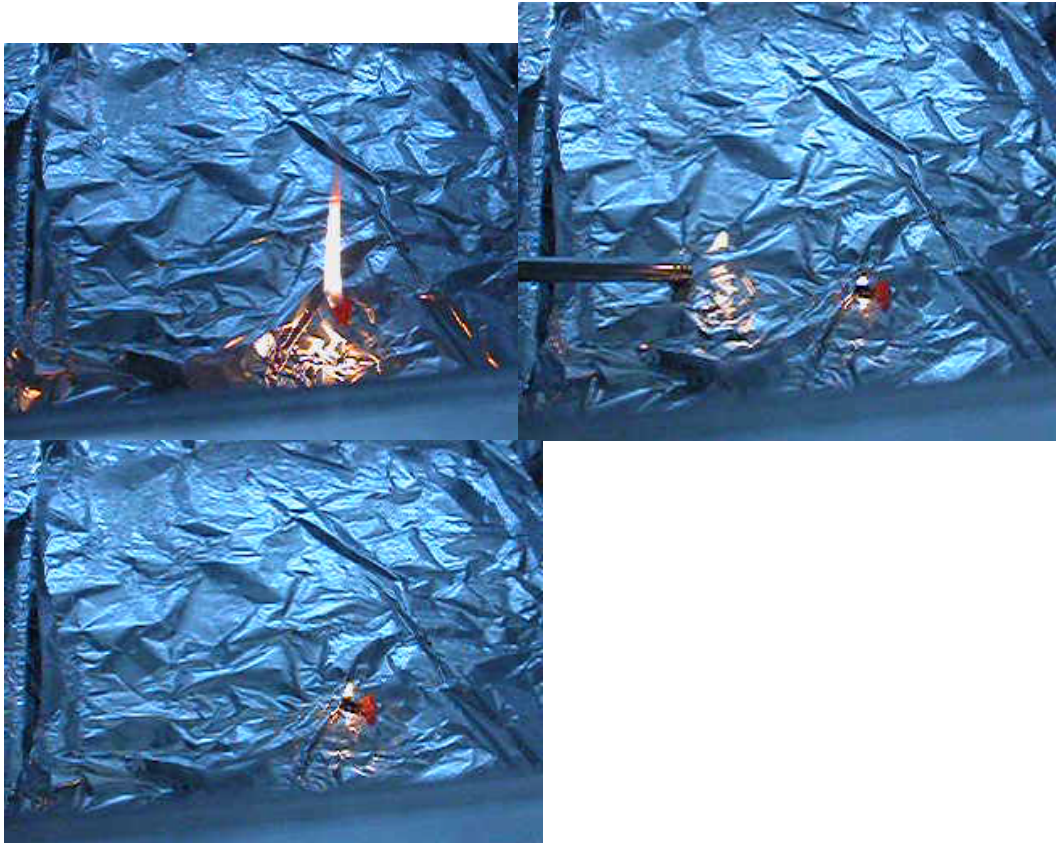


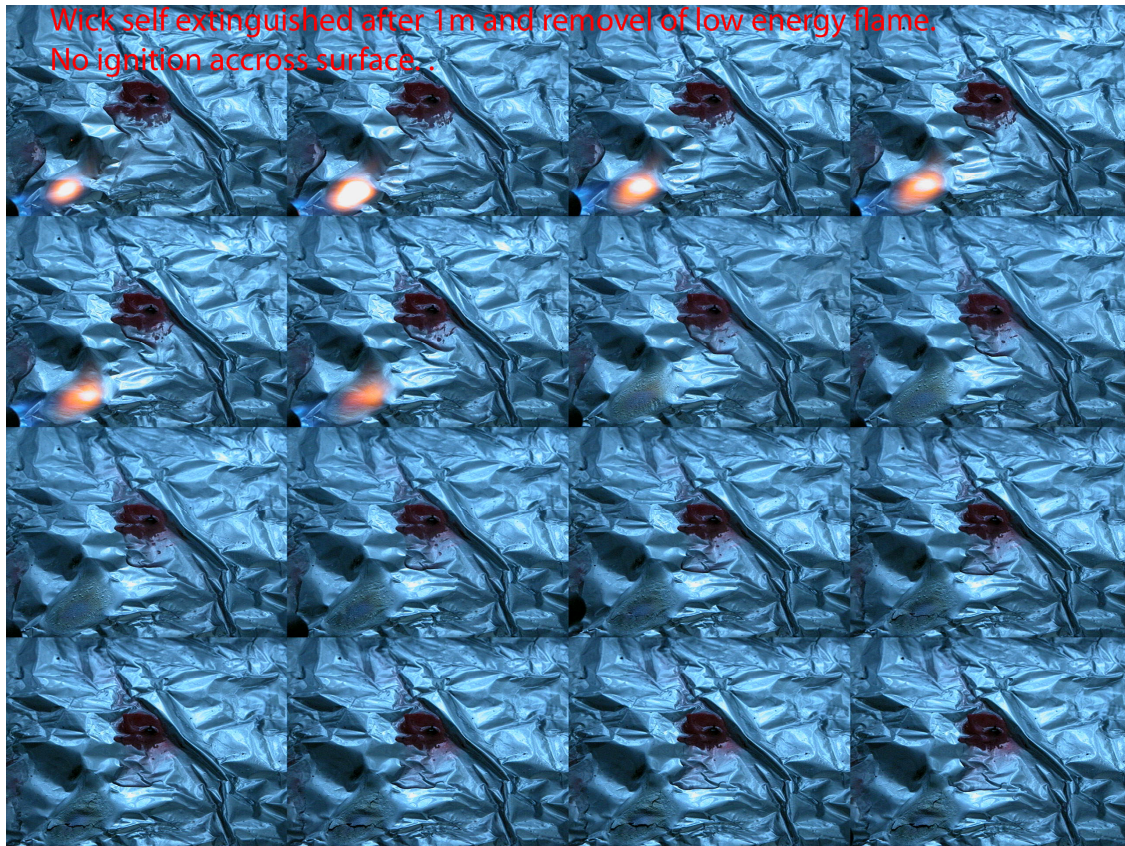
Test Three: Pan pool fire. Room Temp 75F

Approximately 1/16 –1/4 inches of BC-517 was placed in a pan with a rough surface with a candle ignition source at one end with the wick and flame at the surface of the BC-517. The BC-517L was heated to 150 F. No ignition occurred beyond the flame area.

BC 517L heated to 120°F with exposure to candle wick at surface
and low energy flame. No ignition







Test Four:

A torch was applied to the pool which was at 150 F. Ignition occurred and stayed continued to burn till manually extinguished after three minutes. The interesting observation was the burning after three minutes did not migrate across the rough surface of the pan.

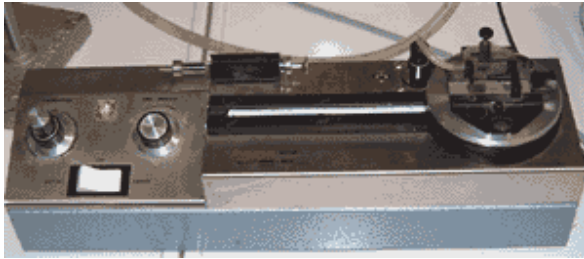


Appendix:



Automatic Pensky-Martens Closed Cup Flash Point Tester

The automated Pensky-Martens flash point tester accurately determines the lowest flash point temperature of fuels, lubricating oils, and homogenous liquids (ASTM D93 A), or liquids containing suspended solids as well as liquids that tend to form a surface film during testing (ASTM D93 B). Flash point tests are simply conducted by mounting the flash cup filled with sample into the test position and selecting a pre- or user-programmed test method. The automation routines provide accurate test results, even with users inexperienced in flash point test methods. The flash point test result is automatically corrected to standard pressure (101.3 kPa). The unit is equipped with a differential Pt-100 RTD probe designed to duplicate the response time of a mercury-in-glass thermometer and with multiple sensors for continually monitoring of instrument function, displaying an error message if a problem is detected. The performance of the electrical ignitor is continuously checked, and the user is notified upon the need of replacement due to either damage or the end of its useful life. When performing a test, the user is also alerted if the first application of the ignitor results in a flash or if no flash point is detected at the end of the test program. If a flash is not detected 30°C above the expected flash point or at 400°C, then the test is automatically aborted for safety.



Setaflash™ Closed Cup Tester

METHODS

ASTM D3278; ASTM D3828-IP303; ISO3679; EN456; ISO3680; BS3900 Part A13; UN Class 3 Non-viscous flammable liquids

Key Features

- Automatic flash detection
- Integral gas tank
- Digital display
- Temp range: ambient to 300°C (*sub ambient using optional accessory*)
- Small sample size: 2ml (*up to 100°C flash point*); 4ml (*100° to 300°C*)
- Rapid result: 1 min (*up to 100°C flash point*); 2 min (*100° to 300°C*)

Small scale flash point testers are universally specified in many international regulations to define and classify "flammable" and "combustible" substances. They provide the most precise and fastest means of carrying out flash points on a definitive or 'flash' - 'no flash' basis both in the laboratory and in the field. A 2 ml sample and 1 minute test time for low temperature tests makes these instruments ideally suited for many applications. Petrochemicals, Biodiesel (FAME), adhesives, foods, flavours, cosmetics, paints/varnishes, waste, pharmaceuticals, polishes, and aerosols are just some of the products routinely tested. Fully meeting the requirements of Rapid Equilibrium methods ISO 3679/3680, Setaflash Testers are the only small scale instruments with flash detection. Setaflash is specified by ASTM for testing aviation turbine fuels (D1655), Diesel (D975), Fuel Oil (D396), Gas Turbine Fuel (D2880), and Kerosine (D3699) and is also the only instrument recommended for testing waterborne paints.